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THE "EFFECTS" OF INFANT DAY CARE RECONSIDERED

Jay Belsky

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The "Effects" of Infant Day Care Reconsidered

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ABSTRACT

Evidence concerning the developmental correlates of nonmaternal care in the first year of life are examined with respect to infant-mother attachment and subsequent social development. Even though the evidence is not without its inconsistencies, a circumstantial case, remarkably consistent with attachment theory, can be made that extensive infant day care experience is associated with insecure attachment during infancy and heightened aggressiveness and noncompliance during the preschool and early school-age years. Several studies indicate that such later consequences may dissipate over time, but it is not evident that this is always the case. It is concluded that entry into some nonmaternal care arrangement in the first year for more than 20 hours per week may be a risk factor in the emergence of developmental difficulties and that the ultimate consequences of such risk are best understood in the context of characteristics of the child, the family, and the caregiving milieu. It is emphasized that this reading of the literature carries with it no inevitable implications for public policy.

The Effects of Infant Day Care Reconsidered

Almost a decade ago the Department of Health, Education, and Welfare commissioned a series of reports concerning characteristics, consequences, and usage of child care services in the United States. As a member of one team charged with reviewing and summarizing the current state of knowledge regarding the effects of day care on child development, I helped produce a technical report and a subsequent publication critically evaluating what was then known about the effects of supplementary care arrangements (Belsky & Steinberg, 1978; Bronfenbrenner, Belsky, & Steinberg, 1976). Careful scrutiny of published and unpublished research reports led to several conclusions, many of which have been widely cited in both the scientific and popular press. With respect to cognitive development, for example, our analysis indicated that day care rearing had neither salutary nor adverse consequences for the intellectual development of most children, though in the case of children from economically impoverished households, typically discerned declines in IQ scores across the preschool years appeared to have been prevented--or at least delayed--by participation in center-based programs.

With respect to children's emotional development, considered principally in terms of the child's attachment to his/her mother, we concluded that "the total body of evidence ... offers little support for the claim that day care disrupts the child's tie to his mother." We went on to observe that "the absence of evidence for deleterious effects of day care in existing research does not mean, however, that no such effects occur." Important to recognize, we pointed out, was the fact that most studies "involved children from day-care programs which may not be

representative of those available to most parents, namely, centers run by universities for research purposes and providing high quality care" (Belsky & Steinberg, 1978, p. 939). The implication, of course, was that future research on children reared in child care arrangements more typical of those routinely available in the United States might produce quite different findings.

Finally, and with respect to social development--defined in terms of children's interactions and relationships with agemates and nonparental adults--the available evidence led us to offer our only real words of concern. Group rearing at early ages, it appeared, was associated with greater peer orientation, including tendencies to interact in both more positive and negative ways with agemates. In addition, some studies indicated that day-care-reared children were less responsive to adults, directing more aggression toward them and being less cooperative or compliant with them.

In the time since the publication of our initial review of the research evidence, I have twice taken the opportunity to formally update and extend our analysis of the effects of day care (Belsky, 1984; Belsky, Steinberg, & Walker, 1982). Conclusions regarding cognitive development have remained substantially unchanged, as have those regarding social development. By 1982 and 1984, though, including a congressional testimony to the U.S. House of Representatives Select Committee on Children, Youth, and Families (Belsky, 1985), notes of caution were interjected with respect to the effects of nonmaternal care on socioemotional development, particularly in the case of children who began nonmaternal care prior to their first birthday. These were motivated initially by a report of Vaughn, Gove, and Egeland (1980) indicating that

in a sample of economically-disadvantaged families, nonmaternal care initiated in the first year was associated with a pattern of insecure-avoidant infant-mother attachment.

Even though Vaughn's study sample was unique (impoverished, single parent), the quality of care experienced by infants was suspect, and the day-care sample did not display more insecure attachment overall (just more insecure-avoidant attachment), this study took on special significance; there were several reasons for this. First, the findings of this investigation drew particular attention to nonmaternal care in the first year, because children who initiated care between 12 and 18 months of life were no more likely to display insecure-avoidant attachments than a comparison group reared at home by mothers through 18 months of age. The fact that Vaughn et al.'s subjects started care about the same age as those participating in an earlier investigation who had been found, as preschoolers, to be more physically and verbally aggressive with adults and peers and less cooperative with grown-ups also added significance to this study (Schwarz,, Strickland, & Krolick, 1974). This was because the Vaughn et al.'s (1980) findings, when considered in light of the Schwarz et al. (1974) data, were remarkably consistent with expectations derived from attachment theory (Ainsworth, 1973, 1982; Bowlby, 1969, 1973; Sroufe, 1979; Sroufe & Waters, 1977). That is, children with insecure-avoidant attachments to their primary caregivers could be expected to be at heightened risk for experiencing difficulties in social relations with others, and these difficulties might well take the form of heightened aggressiveness and lessened compliance and cooperation, particularly with adults, that Schwarz et al. noted over 10 years ago. The juxtaposition of the Vaughn et al. (1980) findings regarding the effects of infant day care

on infant-mother attachment and those of Schwarz et al. (1974) concerning the effects of infant day care on social development during the preschool years, thus raised the possibility that infant day care might promote, or be associated with, the development of anxious-avoidant attachment and, thereby, subsequent aggression and noncompliance.

This possibility, consistent with attachment theory, seemed all the more reasonable in view of the fact that Vaughn et al. (1980) employed in their investigation a methodology and scoring procedure for evaluating the infant-mother attachment relationship which they and others had found to be predictively valid with respect to later development (see below). It is ironic that I underscore here the utility and validity of the Strange Situation separation procedure utilized by Vaughn et al. (1980) to assess the security of the infant-mother attachment relationship given the criticism directed toward it in our initial reviews of the day care literature (Belsky & Steinberg, 1978; Bronfenbrenner et al., 1976). But, as we noted in our first re-examination of this data base (Belsky, Steinberg, & Walker, 1982), although the virtual absence of validational evidence concerning the Strange Situation procedure necessitated a critical stance at the time of writing our initial day care review, the presence of such evidence in the years which followed similarly necessitated a change of attitude (Belsky, Steinberg, & Walker, 1982).

The data that have become available over the past several years, pa ticularly since the publication of the Vaughn et al. (1980) report, have led me to re-examine once again the evidence concerning relations between the use of nonmaternal child care in the first years of life and socioemotional development during infancy and early childhood. This would seem to be especially wise in view of Rutter's (1981) conclusion

concerning the effects of day care on the infant-mother relationship following his own examination of the literature:

> ... questions must remain about the effects of day care on security of toddler's attachments. The evidence is inconclusive but it seems that, although most young children do not become overtly insecure and anxious as a result of day care, it is possible nevertheless that more subtle ill effects occur in some children. The matter warrants further study. (p. 9)

Another reason why a special look at nonmaternal child care initiated in the first year seems particularly appropriate is because of its ever increasing usage. Although not widely recognized, the fastest growing sector of the employed-mother labor market is that of women with children under one year of age. Between 1977 and 1982 this nation witnessed a 40.4% increase in the employment of such women, so that by 1982 one of every three women (33.7%) with infants less than 12 months of age were working (Klein, 1985). By June, 1985, virtually one of every two such women were employed (Kamerman, 1986), a change reflecting a growth rate of more than 45% from just three years earlier!

When it comes to considering how the infants of such mothers are cared for, it is important to recognize that a diversity of care arrangements exist. In 1982, 77% of all infants spending a substantial portion of their day in some form of nonmaternal care were cared for in their own or someone else's home, with strikingly few spending their days in those highly visible day care centers which the lay public associates with the term day care. The most recent statistics, available only in terms of children under three years of age, reveals that (as of June, 1985) 45% of these infants and toddlers were cared for by a relative (27%

in own home; 18% in relative's), 24% were cared for in family day care, and 10% in centers or other group facilities (Kamerman, 1986).

The diversity of arrangements in which infants find themselves--and in which research scientists find them for purposes of study--should alert us to the fact that all studies of the effects of infant day care (or day care more generally) are really studies of the ecology of infant care. To the extent that day-care-reared infants do differ in their development from home-reared-infants, then, we must be cautious about attributing the cause of these differences to day care per se. This is because there are a plethora of factors which are confounded with the use of nonmaternal child care, many of which cannot truly be controlled, either by research design or statistical methods, yet which may well be responsible for differences discerned between children with varying rearing experiences in the first year of life. These include, in addition to simple motivation to use day care, a variety of parental attitudes and family practices which may well be associated with day care usage and child development. It is undoubtedly for this reason that reviewers and investigators often considering the very same phenomenon, especially in infancy, speak in terms of the effects of maternal employment (e.g., Hoffman, 1983), the effects of nonmaternal care (e.g., Etaugh, 1980), and the effects of day care (Belsky & Steinberg, 1978; this paper). In making comparisons between the development of infants who are and are not reared in some kind of supplementary, nonmaternal care arrangement, it is probably most appropriate to think in terms of the "ecology" of day care rather than in terms of the "effects" of day care.

In what follows, I present a re-examination of what is known about the development of children reared in nonmaternal child care arrangements

sometime during the first 12 or so months of life. I restrict myself to supplementary care initiated during this period of development because it is here, and only here, where there may be need to modify conclusions reached in past reviews. Even though we cannot be certain that differences in development--if discerned--are a result of care per se, the mere chronicling of similarities and differences is deemed important given the virtual explosion in usage of nonmaternal care in this sector of the population over the last decade.

This review is comprised of three sections. In the first I consider the emotional tie of infant to mother, conceptualized in terms of the attachment relationship, because this has been the principle "outcome" studied, especially during the first 12-18 months of life, in virtually all investigations of nonmaternal care during the infancy years. In the second section, attention is turned to the social development of preschool and school-age children who have been reared since infancy in day care. Unfortunately, most of the studies to be discussed in this second section do not involve the same samples as those considered in the prior section, because few day-care children have been studied in infancy and again during subsequent developmental periods. Despite this general absence of longitudinal evidence, my plans are to draw what I believe to be theoretically meaningful connections between the two sets of studies in order to argue that the evidence reviewed pertaining to the assessment of attachment in infancy and later social development is strikingly consistent with basic theoretical propositions of attachment theory and that, as a result, both sets of data become particularly noteworthy. Indeed, it is the juxtaposition of these distinct, but apparently quite related sets of evidence that lead me to raise concerns about infant day

care. A third section is intended to move the analysis of day care research beyond between-group comparisons (day care versus home care) to a consideration of factors and processes which might heighten or reduce any risks that are observed to be associated with nonmaternal care initiated in the first year of life--and thus to variation in the development of children with infant day care experience. Finally, concerns are raised briefly about the politicization of day care research and risks regarding the relation between science and social policy in a concluding section.

INFANT DAY CARE AND INFANT-PARENT ATTACHMENT

The emotional tie between infant and mother, conceptualized in terms of the attachment relationship, figures prominently in most writings concerning infant socioemotional development. Certainly since the time of Freud notions of the developmental significance of this first relationship have been prominent in the study of child development. Bowlby's (1969, 1973), Ainsworth's (1973, 1982), and Sroufe's (1979; Sroufe & Waters, 1977) theoretical and empirical writings have done much to promulgate the position that the quality of this relationship, particularly in terms of the security it affords the developing child, is likely to be influenced by the nature and quality of care the child receives and to affect the child's future development, particularly his/her feelings about self and relationships with others. It is for this reason, as well as a result of classic studies of institutional rearing linking mother-less care and disturbed development in the first years of life, that the attachment bond between infant and mother has been a central focus of research concerning infant day care.

The virtually exclusive attention devoted to this relationship in this first section of the paper is not meant to imply a lack of concern

for, or interest in, the child's other relationships in and out of the family; rather it is dictated by its central place in the day care literature and by the belief that a special focus upon the infant-mother relationship is ecologically and developmentally appropriate. Not only is it the case that most infants in America today, whether in day care or not, establish their first attachments with their mothers, but it is also the case that a wealth of empirical data now documents the utility of 12-18 month evaluations of the security of the infant-mother attachment relationship in forecasting individual differences in child development during the preschool and early-school years (for reviews, see Bretherton, 1985; Lamb et al., 1984; Sroufe, 1985).

Sometimes forgotten in the current debate concerning why variation in the security of infant-mother attachment forecasts individual differences in child development is the fact that only a decade ago students of child development were routinely taught that individual differences in infant social, emotional, and cognitive functioning did not predict subsequent development. Also unnoticed in this debate is the fact that it is largely because of the successful predictions obtained from assessments of attachment security that the central question guiding inquiry into early development has shifted from "Is their continuity in early development?" to "What are the conditions of continuity and discontinuity?" Now that it is well documented, then, that variation in attachment security is predictive of later development, it is only fitting that research on infant day care continues to pay special attention to the infant-mother relationship.

In turning to consider the empirical evidence bearing upon the relation between nonmaternal care in the first year of life and

infant-mother attachment, it is essential to distinguish two sets of studies. The first or early set was conducted prior to the refinement of a methodology for measuring individual differences in attachment that is predictive of future functioning; as we shall see, these initial investigations, besides being of infants cared for in well-funded, high quality, university-affiliated centers, document few consistent differences between day-care and home-reared infants. In contrast, the second set of investigations, carried out following the establishment of a predictively valid methodology and having as their subjects infants reared in a variety of community-based, nonmaternal care arrangements, documents differences between groups of home- and day-care-reared infants that are of potential theoretical interest. In view of the methodological limitations of the first set of studies and the measurement strengths of the second, more recent set, it is my contention that these latter investigations provide the most insight into the potential consequences of day care experience in the first year of life.

The Early Studies

With the exception of the very first published study regarding day care and attachment which used home-observation and interview techniques (Caldwell, Wright, Honig, & Tannenbaum, 1970), most of the early studies of this topic employed experimental, laboratory-based paradigms developed by research scientists for studying normative processes of infant development. As a consequence, particular attention was paid to the degree to which infants became distressed upon separation from mother or following exposure to a strange adult. What was never particularly clear in all this initial day care research was whether it was considered developmentally advantageous or problematical for the child to display

greater or lesser stranger wariness and/or separation distress. As it turned out, most investigations of infant day care which focused upon such affective responses discerned no differences between home-reared and day-care-reared infants (Cochran, 1977; Hock, 1980; Kagan, Kearsley, & Zelazo, 1976, 1978; Saunders, 1972), though several others indicated that either day care infants (Cummings, 1980; Ricciuti, 1974) or home-reared infants (Doyle & Somers, 1978) were somewhat more likely to become distressed, or even that degree of upset was related in a curvilinear fashion to nonmaternal child care experience (Jacobsen & Wille, 1984).

A second procedure which focused upon children's willingness to move away from their mothers produced more consistent findings indicating that infants and toddlers with early experience in university-affiliated infant centers were more willing to leave their mothers' sides to approach unfamiliar children or a strange adult (Finkelstein & Wilson, 1977; Kagan et al., 1976, 1978; Ricciuti, 1974). Although such evidence suggested to the investigators that young children with early care experience were less apprehensive and more ready to engage novel social agents, other interpretations are also possible (i.e., less closely attached to mother). But the major problem with these or other interpretations, like those concerning variation in stranger wariness and separation protest, is their speculative nature, given the fact that no evidence exists which documents the developmental significance of inclinations to move away from or remain physically close to mother.

Measuring Attachment

This issue of the meaning of behavior is one that eventually became central to scientists interested in understanding the characteristics,

consequences, and determinants of individual differences in the infant-mother attachment relationship (Masters & Wellman, 1974; Waters, 1978). In fact, lack of confidence in the validity of any number of potential indices of attachment resulted in a great deal of basic research being carried out, all of which was not in the least bit concerned with day care, but which nevertheless produced a means of discriminating secure from insecure relationships and, thereby, of enhancing day care research. In the years which followed the publication of most of the initial day-care attachment studies, basic research on infant development revealed that it was not so much crying upon separation or even willingness to approach an unfamiliar other which reliably indexed individual differences in the security of the infant-mother attachment relationship, but rather the behavior which the infant/toddler directed or failed to direct to the mother upon reunion following separation. Studies by Waters (1978) and others at the University of Minnesota (Matas, Arend, & Sroufe, 1978; Waters & Sroufe, 1983) convincingly demonstrated that the behavior of secure infants was characterized by their tendency to positively greet mother following separation and approach (especially if distressed) and be comforted by her (when upset by separation). Babies whose relationships were insecure tended to engage in one of two quite different behavior patterns. Those whose relationships are labeled insecure-avoidant actively avoid psychological contact with mother, moving away from her, aborting approaches to her, or averting gaze so as not to make eye contact with her, whereas those whose relationships are labeled insecure-resistant actively resist contact with mother (by pushing away) even after seeking such contact and are likely to cry in an angry, petulant manner or angrily push away a toy that is offered by mother.

Evidence of the validity of these distinctions comes from a large number of follow-up studies, conducted by a variety of investigators across the country, which indicate that infants who avoid and/or resist mother to such an extent that they can be classified as anxiously attached generally look less competent as they grow older. Not only have such infants been found, as toddlers and preschoolers, to be less empathic, less compliant, less cooperative, and to exhibit more negative affect and less self-control (e.g., Egeland, 1983; Joffee, 1981; LaFreniere & Sroufe, 1985; Londerville & Main, 1981; Main, 1973; Main & Weston, 1981; Maslin & Bates, 1982), but they have also been found, as five and six year olds, to be more at risk for developing behavior problems (Erickson et al., 1985; Lewis, Feiring, McGuttog, & Jaskir, 1984, for boys only; but see Bates, Maslin, & Frankel, 1985 for failure to replicate).

The point to be made here is not that each and every study comparison indicates that reunion behaviors in the Strange Situation and the attachment classifications derived from them discriminate children's subsequent functioning in other settings, but rather that incontestable patterns are evident in the literature regarding the future functioning of children with secure versus insecure infant-attachment relationships. The implication which derives from this observation is that the initial day care research concerned with infant-mother attachment was misguided given its focus upon infant behaviors which ultimately proved to be <u>insensitive indicators</u> of the affective quality of the attachment bond (i.e., separation distress, stranger wariness, approach to novel social agents). The very possibility that this might have been the case seems to have been foreshadowed by Kagan et al.'s (1978) prescient conclusion to their own

comprehensive study of infant day care which revealed few rearing-group differences:

> Day care, when responsibly and conscientiously implemented, does not seem to have hidden psychological dangers. Since this generalization flies in the face of much popular belief, it is wise to maintain a skeptical attitude toward it. One valid objection may be that our methods of assessment were not sufficiently sensitive. (p. 262; emphasis added)

Later Studies

Since 1980 and the emergence of evidence validating the focus upon infant reunion behavior as a "window" on individual differences in the security of the infant-mother attachment bond, a number of studies of maternal employment and infant day care have been reported. In turning to consider these most recent investigations, all of community as opposed to university-based nonmaternal care, we focus first upon ratings made of the extent of avoidance which infants display upon re-encountering their mothers following separation and then upon the actual appraisal of the child's security using formal classifications which depend heavily upon such ratings. To be noted is that it is these latter measures of attachment which have proven most stable over time and predictive of individual differences in children's subsequent development (Waters, 1978).

Avoidance Behavior

The finding from the previously cited Vaughn et al. (1980) investigation that infants who initiated nonmaternal care in the first year of life were more likely to be classified as anxious-avoidant in their attachments was the first to draw special attention to a linkage

between extensive nonmaternal care during this developmental period and avoidance. In the time since Vaughn et al.'s report appeared, a number of other investigators have also found infants with extensive nonmaternal care experience to avoid their mothers upon reunion more than other infants. Consider first a study by Hock and Clinger (1980) which indicated that one year olds with prior experience in day care centers and in family day care homes displayed significantly more avoidance of mother upon reunion following separation than did a matched group of home-reared, middle-class children; further scrutiny of this difference indicated, however, that it was restricted principally to boys. In a later investigation by Schwartz (1983) of infants in family day care (involving one caregiver and one to eight other children), a significant association between avoidance and nonmaternal care also emerged, but in this case heightened avoidance was restricted to children in care on a full-time basis.

Questions can be raised about the meaning of the rearing-group differences discerned in these two studies, especially in the case of Hock and Clinger's research, because there is reason to wonder whether the extent of avoidance chronicled was sufficient to raise concerns about actual insecurity. To be noted, however, is that in the case of the Schwartz (1983) study, 82% of the infants reared in full-time day care scored moderate to high on the seven-point avoidance scale (i.e., >3), whereas the respective figures in the part-time day care and in the home-care groups were 50% and 35%, respectively. Moreover, as would be expected of infants whose attachments would be classified as anxious-avoidant had formal classifications been made, mean avoidance scores increased across the two reunion episodes in the case of the

children in the full-time day care group, whereas in the part-time group they remained virtually unchanged and in the home-care group they actually declined.

The Hock and Clinger (1980) study is worth additional comment, as are two other investigations by Hock, one of 33 one-year-olds from middle-class families reared at home or in day care centers (Brookhart & Hock, 1976) and the other of some 97 infants (most middle-class) who began family day care or babysitter care prior to their third month of life (Hock, 1980), which did not document any association between avoidance and the use of nonmaternal care. In all these studies infant behavior in the Strange Situation was narratively described and subsequently transcribed for coding rather than videotaped as is routine today. Given the difficulties inherent to coding avoidance, it is doubtful that any scientist today would rely upon any data collection strategy other than one which permitted repeated viewing of the reunion situation. Thus, there would seem to be grounds for questioning whether avoidance would have been more apparent and been scored higher in all these studies if the coders had had the opportunity to repeatedly look for the often-subtle, but nevertheless significant forms in which avoidance of the mother can be displayed in the Strange Situation. The issue then is whether the data collection procedures employed by Hock might simply have been too insensitive to accurately assess the relation between avoidance and nonmaternal care.

This same general issue of sensitivity of measurement needs to be raised with regard to two studies by Doyle, one of middle-class Canadian children enrolled in centers and the other of demographically similar children cared for in a variety of arrangements (centers, family day care,

babysitters) (Doyle, 1975; Doyle & Somers, 1978), which failed to discern any rearing-group differences in behaviors suggestive of insecure attachments. Not only did subjects in these studies range from 5-30 months--and there is no evidence of the validity of the Strange Situation for assessing attachment security with infants younger than 11 months and children older than 20 months--but it is also the case that in all this research the reunion behaviors indicative of insecure attachment (avoidance and resistance) were observed too infrequently to analyze--in only two of 24 cases in 1975 and three of 34 cases in 1978. This failure to observe behavior that has been noted in so many studies raises questions about the time-sampling measurement system employed in these investigations by Doyle. In point of fact, I am aware of no study whatsoever--whether concerned with day care or not--that has reported such a lack of opportunity to observe (and record) avoidance and resistance.

The legitimacy of this critique of the Hock and Doyle research receives support from two recent investigations which, like the Schwartz (1983) study, employed video technology and the standard rating scales to score avoidance in the Strange Situation. Both Barglow, Vaughn, and Molitor (in press) and Belsky and Rovine (in press) found that infants exposed to 20 or more hours of nonmaternal care per week sometime prior to their ninth month of life avoided their mothers to a significantly greater extent when one year of age than did infants with less infant day care experience. In the former study comparisons involved infants from affluent families cared for by nonrelative babysitters in their own homes and in the latter they involved infants from working and middle-class families cared for in a wide variety of nonmaternal care arrangements. The fact that Chase-Lansdale and Owen (in press) failed to document an

association between avoidance and extensive day care experience in the first year of life using both rating scales and video technology calls into question, however, this methodological critique of the Hock and the Doyle studies. But as we shall discover as we turn to consider the results of investigations that report formal classifications of attachment security, there are design features of the Chase-Lansdale and Owen (in press) research which raise serious questions about the meaning of their null findings.

Attachment Security

Ultimately the issue of heightened avoidance becomes most critical when set in the context of the actual security of the infant-mother attachment relationship. That is, is sufficient avoidance or resistance evident to lead to the evaluation of the child as insecure using formal classification criteria? In addition to the Vaughn et al. (1980) investigation which documents an association between first year nonmaternal care and anxious-avoidant attachment (but not anxious attachment more generally), there exist only four studies that address this issue.[1] It is noteworthy that, unlike the Vaughn et al. study of infants from impoverished and often single-parent households, all four of these investigations concern infants from working-, middle-, and even upper-class, maritally intact families.

The already mentioned study of infants from affluent homes by Barglow et al. (in press) not only revealed that infants in babysitter care for 20 or more hours a week displayed significantly more avoidance and, consequently, were significantly more likely to be classified as insecure-avoidant in their attachments to their mothers, but also that such infants were significantly more likely than infants reared at home on

a full-time basis to be classified as insecure more generally (i.e., insecure-avoidant plus insecure-resistant). Belsky and Rovine (in press) also discerned a significant association between such extensive nonmaternal care and significantly heightened risk of the infant being classified as insecure. In fact, when all seven infants with extensive nonmaternal care experience who were cared for by their fathers were excluded from analysis, the rate of insecurity among infants experiencing more than 20 hours of nonparental care per week increased from 43% to 49%--a figure virtually identical to that reported by Barglow et al. whose research design excluded father care from consideration. Finally, when evidence presented by Jacobsen and Wille (1984) showing a significant association between extent of nonmaternal care and attachment security is reanalyzed to permit comparison between infants in care for more or less than 20 hours per week, the data once again reveal that those in care for an extensive period of time are significantly more likely to be classified as insecure in their attachments to their mothers ($x^2 = 6.50$, $p < .01$).

Of the four studies available which compare groups of children (from nonrisk environments) with varying nonmaternal care experience in the first year in terms of actual security of attachment, only Chase-Lansdale and Owen (in press) fail to discern an association between extensive nonmaternal care experience and insecurity. One possible reason for this absence of group differences is that they included in their study design only infants whose mothers had returned to work within six months of the babies' births on the theoretical assumption that it is nonmaternal care which disrupts an already established attachment bond that might promote insecurity, rather than care which coincides with the emergence of the bond (Hoffman, 1983; Scarr, 1984). Before it can be assumed, however,

that failure of this study to discern differences between child care groups was the result of the infants' age of entry into day care, another time-related possibility must be entertained.

Could it be that a study such as Chase-Lansdale and Owen's (in press) which was specifically planned as an investigation of maternal employment and enrolled most families when infants were one year of age systematically (though unintentionally) excluded the very families most likely to find the dual-earner situation particularly stressful and, conceivably, insecurity promoting? That is, could it be that by the time infants are one year of age that those families most likely to decline the invitation to participate in a study of maternal employment are those experiencing the most difficulty with this situation whereas those who find it to work well are most likely to accept the invitation to participate? After all, in the Barglow et al. (in press) and Belsky and Rovine (in press) investigations which chronicled significant associations between insecurity and extensive nonmaternal care, families were recruited prenatally to participate in longitudinal research projects that did not have as their central focus maternal employment and nonmaternal care.

As it turns out, evidence to suggest that timing of subject recruitment may be critical for accounting for the differences across these two sets of studies comes from the Chase-Lansdale and Owen (in press) investigation itself. When comparisons were made between the 10 infants whose mothers worked on a full-time basis but whose families were recruited prenatally and the 30 infants whose mothers also worked full-time but whose families were recruited into the research project when infants were one year of age, it was discovered that the rate of insecurity in the prenatally recruited families was more than three times

as great as that in the postnatally recruited families (60% versus 17%). It is of special interest to note that this same pattern was evident in the case when security of infant-father attachment was considered (80% versus 28%).

Despite this rather striking bias as a function of timing of recruitment in the Chase-Lansdale and Owen (in press) study, it turns out that when the attachment classification data from all four studies considered in this section are subject to a single analysis which includes some 464 cases, an exceedingly significant association emerges between extent of nonmaternal care in the first year of life and attachment security (χ^2 [1] = 12.31, $p < .0005$). As can be seen in Table 1, the rate of insecurity among infants from maritally intact families that cannot be considered economically impoverished is 1.6 times greater when infants experience more than 20 hours of nonmaternal care per week than when they experience virtually none at all or less than 20 hours of care per week. Whereas the rate of insecurity in the former group is 41.5%, in the latter group it is 25.7%.

Insert Table 1 about here

Infant-Father Attachment

These data on infant-mother attachment lead one to wonder about the relationships that infants in nonmaternal care establish with their fathers. To date, only two investigations have addressed this issue--and their findings are remarkably consistent (Belsky & Rovine, in press; Chase-Lansdale & Owen, in press). In both studies, males exposed to more than 35 hours of nonmaternal care per week were significantly more likely

to be classified as insecure in their attachments to their fathers than were other boys. In both studies it was also true that boys with extensive nonmaternal care experience in the first year were at heightened risk of being insecurely attached to both parents. Since it has been demonstrated on more than one occasion that infants insecurely attached to both parents look least competent whereas those securely attached to both parents look most competent (Belsky, Garduque, & Hrncir, 1984; Main & Weston, 1981), this now replicated finding of greater insecurity to father of sons in supplementary care in the only studies ever to consider fathers takes on added significance.

Preliminary Conclusions

It should be evident from the preceding analysis that not every study of attachment has discerned differences between infants reared at home or in some kind of child care arrangement sometime during their first 12 or so months of life. At the same time, however, it would appear to be incontestable that some degree of association exists between extensive nonmaternal care--as routinely experienced in this country--and avoidance and even insecurity. Of special interest in this regard is the fact that this association between infant day care and avoidance is actually consistent with trends in the more general day care literature concerning preschoolers. As Clarke-Stewart and Fein (1983) observed in their comprehensive review of the evidence appearing in the most recent edition of the Handbook of Child Psychology,

> children in day care are more likely than children at home to position themselves further away from mother, to spend less time close to or in physical contact with mother, and to ignore or avoid mother after a brief separation. The difference is not observed in

every child or every study, but the consistent direction of the differences is observed. (p. 948)

The point to be made, then, is that there is an emerging pattern, particularly in studies of infant care reported since 1980, in which 20 or more hours per week of nonmaternal child care, especially that initiated in the first year, whether in homes or in centers, is associated with the tendency of the infant to avoid or maintain a distance from the mother following a series of brief separations. Some contend that such behavior reflects an underlying doubt or mistrust about the availability of the mother to meet the baby's needs and, thus, an insecure relationship. Moreover, since it is known that this behavior pattern is related to a set of developmental outcomes that most developmentalists would regard as less than desirable, some are inclined to conclude that the quality of the mother-child bond and, thereby, the child's future development may be in jeopardy (see Fraiberg, 1977).

Before this interpretation is accepted, it must be noted that other scientists read the very same evidence in a very different way. Even though the same pattern of avoidance is noted, it is interpreted not as deficit or disturbance but rather as adaptive and possibly even precocious behavior. After all, day care infants experience many separations; thus it seems sensible for them not to orient toward mother: "Perhaps day care children have simply had more experience in the type of situation used to assess attachment, so they find it less stressful and therefore exhibit less overt and intense attachment behavior (i.e., proximity)" (Clarke-Stewart & Fein, 1983, p. 956). In addition, because the behavioral tendency of children as they get older is to remain more

distant from their parents, the behavior of day-care-reared 12-18 month olds may be evidence of maturity:

> In children receiving care exclusively from mother, avoidance may be a pathological response reflecting an interactive history with a rejecting mother, while for children in day care greater distance from, or ignoring of, mother at reunion may be an adaptive response reflecting a habitual reaction to repeated daily separations and reunions. In these latter children, greater physical distance from mother and apparent avoidance may, in fact, signal a precocious independence. (Clarke-Stewart & Fein, 1983, p. 949)

Which interpretation is correct--insecurity or precocity? Here I concur with Clarke-Stewart and Fein (1983) that "there is no way to determine at this point if the apparent avoidance of mother observed in day care children in some studies is a disturbed or adaptive pattern" (p. 949, emphasis in original). But this very uncertainty leads me to re-examine other evidence in the day care literature linking nonmaternal child care in the first year with subsequent social development in hopes of gaining some insight.

THE SOCIAL DEVELOPMENT OF DAY-CARE-REARED INFANTS

Most reviewers of research on day care and child development, myself included, have considered separately those data pertaining to the social functioning of day-care-reared preschoolers with agemates and adults and those bearing on the infant-mother attachment bond of day-care-reared infants (Belsky, 1984; Belsky & Steinberg, 1978; Belsky, Steinberg, & Walker, 1982; Clarke-Stewart & Fein, 1983; Etaugh, 1980; Hoffman, 1983; Rubenstein, 1985; Rutter, 1981). One good reason for this is the virtual absence of longitudinal studies of day-care children which examine

infant-mother attachment as the salient developmental issue of the infancy period and social behavior with peers and adults as the later developmental focus. Another reason why the two sets of day-care studies have not been juxtaposed in order to consider possible longitudinal processes is that there has been little impetus to do so; because the consensus among reviewers has been that day care does not unduly affect the child's attachment to mother (Belsky & Steinberg, 1978; Etaugh, 1980; Hoffman, 1983; Rubenstein, 1985), there appeared little reason to consider differences in the social functioning of home- and day-care-reared children in terms of earlier development.

Now that we are ready to seriously entertain the possibility that infant day care may indeed affect the security of the attachment relationship, it seems only appropriate to reconsider what is known about the social development of older children who have experienced nonmaternal care in the first year of life. In this regard it is useful to keep in mind that several investigations concerned not at all with infant day care have reported associations between anxious-avoidant attachment in infancy and subsequent noncompliance, aggressiveness, social withdrawal, and behavior problems more generally (Erickson et al., 1985; Main & Weston, 1982; Maslin & Bates, 1982; Sroufe, 1983). As we shall see, many of these very same "outcomes" are also associated with infant day care experience.

Evidence that this is indeed the case can be found in the very first follow-up study, conducted more than a decade ago, of infants cared for at a Syracuse University day care center (Schwarz, Strickland, & Krolick, 1974). Observations made on a group of children following four months of experience in a new preschool program revealed, as noted earlier, that three- and four-year olds (from impoverished backgrounds) with infant care

histories were more aggressive (both physically and verbally) with adults and peers, less cooperative with grown-ups, and more motorically active than a comparison group for whom the preschool represented their first supplementary care experience. An additional difference between groups, significant at the 10% level only, indicated greater tolerance for frustration on the part of home-reared children (as reflected in the ability to accept failure and to be interrupted). All data did not point in the direction of negative effects of early day care, however, as another observational study of apparently the same sample indicated that the children with prior group rearing were more social with agemates (Lay & Meyer, 1973). Moreover, an unpublished conference presentation reporting the results of observations which assessed the frequencies of behaviors (in contrast to more global ratings) indicated that even though the children with infant day care experience spent more time in high activity areas and less time in focused-task areas at the preschool center, and exhibited more negative behaviors (especially girls) than late-entry children, over time the difference in negative behavior between groups diminished and eventually disappeared (Meyer, 1979).

In a variety of respects these findings regarding children first enrolled in an experimental infant center at Syracuse University are much like those subsequently reported in the literature. Consider, for instance, Rubenstein and Howes' (1983) comparison at 3 1/2 years of a small sample of middle-class children who had been enrolled in one of five community-based, infant-toddler centers toward the end of their first year with children who had been continuously reared at home by their mothers. Even though home- and day-care-reared groups did not differ on the total score derived from Richman and Graham's (1971) behavior problem inventory

(which was completed by mothers), a subscale analysis did reveal significant differences on three of 12 component ratings: Children with infant day care experience were rated as having more fears, being more active (like Schwarz et al., 1974) and throwing more frequent and intense temper tantrums. In fact, observations of children's behavior during a boring task revealed children with infant day-care histories to be less compliant with maternal directives than home-reared children (compare to Schwarz et al., 1974 findings of less cooperation with adults). Lest compliance on a boring task be dismissed as an invalid measure, it should be noted that Rubenstein and Howes (1983) found compliance in this situation to be associated with the overall score on the behavior problems checklist (i.e., those children displaying more compliance were rated as having significantly fewer behavior problems). The observational data along with the maternal report data led Rubenstein and Howes (1983) to conclude that:

> noncompliance in this study reflected a more anxious or angry child ... It should be emphasized that noncompliance and temper tantrums are more characteristic of two year old rather than three year old behavior. Thus, we are considering the differences in the day care children to reflect a delay in the negotiation of an age-appropriate developmental issue. At this point it is unclear whether this delay has any significant long term implications. (p. 34, emphasis added)

That it might is suggested by an even more recent study, this one of the social behavior of lower-class kindergarten and first-graders who had been reared on a full-time basis at the Frank Porter Graham Child Development Center (affiliated with the University of North Carolina) throughout their first four years of life. Ratings made by school

teachers at the end of each of these two school years indicated that children who received center-based care in the first year of life, in contrast to those receiving such care any time thereafter, were,

> ... more likely to use the aggressive acts hit, kick, and push than children in the control group. Second, they were more likely to threaten, swear, and argue. Third, they demonstrated those propensities in several school settings--the playground, the hallway, the lunchroom, and the classroom. Fourth, teachers were more likely to rate these children as having aggressiveness as a serious deficit in social behavior. Fifth, teachers viewed these children as less likely to use such strategies as walking away or discussion to avoid or extract themselves from situations that could lead to aggression. (Haskins, 1985, p. 700)

Lest these findings be dismissed as biased teacher reports, it should be noted that not only were teachers likely to rate the children with infant day care experience as more intelligent, but also that observations of their behavior in the classroom by observers blind to rearing conditions revealed them to be more aggressive (Feagans, 1986; personal communication). Like Meyer (1979) in his follow-up study of the more aggressive three- and four-year-olds from the Syracuse infant center, Haskins (1985), too, discerned a trend suggesting "that the excess aggressiveness of children in the experimental group appears to diminish" across time (p. 701). though even by the end of the third year of schooling (2nd grade) significant differences between child care groups remained on several measures of aggression.

This pattern of differences between children with varying infant care experience which are evident after the first two years of life and

generate clear cause for concern, yet appear to dissipate over time is evident in other studies. Consider, in this regard, the results of the comprehensive testing of a large number of two year olds (24-30 months) on the island of Bermuda, which enabled Schwarz and his colleagues (1981; Schwarz, 1983) to compare the functioning of children with varying child care histories. Those children

> who experienced predominantly center group care in the first two years of life, at two years of age were found to have poorer communication skills than children cared for at home, according to the mother's own report and ratings by our testers. During the assessment, which occurred in the home, center group care infants were rated by teachers as more apathetic, less attentive, and less socially responsive. They were judged by testers to be more deviant than children cared for at home. (Schwarz, 1983, p. 2)

Several features of this study are particularly noteworthy. The first is that these group differences held principally for black children and emerged even after controlling for a host of important background variables (i.e., mother's IQ, parents' educations and occupational prestige). Second, within-group variation in quality and extent of care appeared extremely influential in explaining the differences in the Bermudan sample, as performance was poorest for those children who experienced long hours of care in large groups with more limited staff-child ratios. Finally, and possibly most importantly, the differences between center care and home care children diminished over time so that by four years of age it seemed to be the children reared in family day care homes or by sitters in their third and fourth year of

life, rather than those reared in centers in their first two, who performed most problematically (Schwarz, 1983).

Although these longer-term findings mitigate to some extent the concern raised about center-rearing in the first years of life, at least as experienced by most Bermudan infants, another report by this same research group concerning a larger number of three- to five-year-olds rekindles concern. Specifically, McCartney et al. (1982), reporting on a sample of some 156 children, found that even though age of entry in center care exerted no apparent effect upon intelligence and language development, it did adversely affect emotional development: "Children who began group care in infancy were rated as more maladjusted than those who were cared for by sitters or in family day care homes for the early years and who began center care at later ages" (p. 148). That is, they were judged by caregivers to be more anxious, aggressive, and hyperactive--patterns of behavior remarkably consistent with those observed by Schwarz et al. (1974), Haskins (1985), and Rubenstein and Howes (1983).

Although it is not clear whether the differences associated with infant care disappeared over time, or even if they did whether they should be regarded as unimportant, it remains the case that not all studies point to their eventual disappearance. Consider in this regard a retrospective investigation of some 191 middle-class nine- and ten-year-olds (Barton & Schwarz, 1981). Even though teacher ratings did not distinguish between children with varying degrees of out-of-home care prior to kindergarten, peer ratings indicated, even after controlling for both parents' education, that children who entered day care before 12 months of age, or between 12 and 18 months, were viewed as most misbehaving, with children

who experienced supplementary care in their first year "most likely to be labeled troublemakers" (p. 7). Similar results emerged when the variable of interest was "likelihood to cry," with those entering day care on a full- or part-time basis prior to 18 months rated most highly on this behavior. These early enterers to day care also appeared susceptible to internalizing behaviors such as withdrawal, as they were most often characterized as loners. It should be noted in considering the meaning of differences in findings derived from peer and teacher reports that, as Barton and Schwarz (1981) themselves observed, "peers as observers have access to a broader range of behavior than do teachers" (p. 9) and that peer ratings may well be more reliable as well as more valid since the scores each child received from agemates represented the average rating of six peers rather than of a single teacher. In sum, the results of this study indicate that children who entered day care before the age of one were characterized by agemates--when they are nine and ten years old--"as more likely to misbehave ... as more likely to cry when frustrated and more likely to spend time alone than children in other care settings" (Barton & Schwarz, 1981, p. 12).

As was the case with respect to the association between infant day care and attachment, not all studies of social development in the post-infancy years discern reliable differences between children with varying infant care experience; moreover, several investigators indicate that those with nonmaternal care experience in infancy look more socially skilled or well adjusted. In this regard, consider Ramey and Campbell's (1979) finding that children from their high-quality, university-based center appeared more socially confident during testing throughout the first and second year of life than those without infant care experience

(Ramey, McPhee, & Yeates, 1982); but note, too, that Fowler and Khan (1974/1975) discerned no group differences in a similar study. Another investigation which pointed toward positive effects of infant day care involved a comparison of two year olds using the very same rating scales employed by Schwarz et al. (1974) which had shown day care infants to be more aggressive and uncooperative at age four. In this study of 16 children it was observed that those who began care in the first year scored higher on ability to get along with others than children initiating care around two years of age, and also that these two groups were equivalent with respect to cooperation with adults, aggression and tolerance of frustration (MaCrae & Herbert-Jackson, 1975).

Although MaCrae and Herbert-Jackson interpret their findings as a failure to replicate those of Schwarz et al. (1974), the question can be raised as to whether the fact that all of the children in the former investigation were two years younger than those participating in the latter study might actually indicate that the differences discerned by Schwarz et al. (1974) may take time to emerge; certainly the findings of Haskins (1985) regarding heightened aggression in the first two years of public schooling of children with infant care experience are consistent with this possibility, since Ramey and Campbell (1979) actually found that these eventually more aggressive children looked more confident when tested at 6, 12, 18, and 24 months of age. Could it be the case, then, that studying the Schwarz et al. subjects at two years of age would have revealed few differences (in fact, it did--see Caldwell et al., 1970), whereas studying the MaCrae and Herbert-Jackson (1975) subjects at four would have revealed more pronounced differences between groups? Might there be a need to consider, then, manifest and latent effects?

That there might is suggested by a follow-up study of the very sample on which an association between insecure-avoidance and nonmaternal care in the first year was first chronicled and the only investigation that has examined infant-mother attachment at the end of the first year with a focus upon reunion behavior and also has examined subsequent development, specifically, children's functioning when confronted with a challenging problem. Although Farber and Egeland (1982, p. 120) were led to conclude on the basis of their analysis of the problem-solving behavior of these Minnesota children when they were two years of age that "the effects of out-of-home care were no longer striking" and "that the cumulative adverse effects of out-of-home care were minimal," careful scrutiny of the data lead a more cautious reader to a different conclusion. Not only was it the case that toddlers whose mothers began working prior to their infants' first birthdays displayed significantly less enthusiasm than children without early experience in day care, but it was also the case that these day-care-reared infants tended to be less compliant in following their mothers' instructions, less persistent in dealing with a difficult problem, and displayed more negative affect. A more thorough analysis of these same data by Vaughn, Deane, and Waters (1985) revealed, moreover, that while two year olds with insecure attachment histories looked less competent irrespective of their infant-care experiences, those with first year experience in nonmaternal care who had been classified as securely attached to mother at 18 months "showed a deterioration in the quality of adaptation over the period from 18-24 months" (p. 133) and were indistinguishable from formerly insecure children. Thus, it was only formerly secure infants without early care experience who displayed the competencies that might be expected on the basis of their histories of

secure attachment relationships. When considered in developmental perspective, these data raise the possibility that one consequence of early care may be heightened vulnerability to subsequent stress, irrespective of early attachment history.

More than anything else, these data highlight the need to look for subtle and complex effects of nonmaternal care initiated in the first year and underscore the need to think developmentally about enduring effects. We have seen on several occasions that potentially deleterious consequences of early care may dissipate over time; in the reanalysis of the Farber and Egeland (1982) data we see that potential "sleeper effects" might emerge even for children who initially seem to be developing well. Not only must we consider, then, those nonmaternal experiences which intervene between early day care and follow-up assessments of the "effects" of such care, but also exactly which assessments are made at what time. Could it be that the diminishment of some effects reflects the fact that some assessments used at one developmental period are inappropriate at a later time, rather than true disappearance? Or, could it be that even when manifest effects disappear, latent vulnerabilities remain?

Not only am I convinced that data do not yet exist which adequately address much less answer these queries, but I am also certain that a complete understanding of enduring or disappearing manifest and latent effects requires focus on continuing experience as well as earliest experiences. There are few developmentalists today who contend that early experiences other than those which could be characterized as catastrophic (of which infant day care is certainly not one) have inevitable longer-term outcomes associated with them; this is not to say, however,

that they may not be associated with greater or lesser risk (probabilistically speaking) for certain consequences than would different early experiences. Future experiences undoubtedly serve to maintain or modify earlier effects, so complex longitudinal designs will be necessary to examine the conditions under which early care may or may not be related to patterns of social development which most would regard as undesirable--some of which we have observed already in a sizable number of studies.

Interim Conclusion

What are we to make of all the evidence I have reviewed? On the one hand, it could be concluded that the data are too inconsistent to draw any definitive conclusions. While this is most certainly the case, if one does not feel compelled to draw only irrefutable conclusions, a relatively persuasive circumstantial case can be made that extensive infant day care experience may be associated with increased avoidance of mother, possibly to the point of greater insecurity in the attachment relationship, and that such experience may also be associated with diminished compliance and cooperation with adults, increased aggressiveness, and possibly even greater social maladjustment in the preschool and early school-age years.

What is most noteworthy about these very possibilities is that they are strikingly consistent with basic theoretical contentions of attachment theory. Also striking is the fact that, for the most part, the total body of evidence on nonmaternal care in the first year, including the early attachment and later social development data, have not been organized in terms of such a theoretical framework (or any other for that matter, though see Gamble & Zigler, 1986). It is certainly not inconsistent with attachment theory that repeated separations in the first year of life, as

routinely associated with day care usage, might affect the emerging attachment relationship, and even disturb it from the standpoint of security (or at least avoidance). Further, the theory clearly assumes that avoidance reflects some doubt on the part of the infant with respect to the availability and responsiveness of the mother and may well serve as a coping strategy to mask anger (Main & Weston, 1982). Finally, the theory clearly assumes that an avoidant attachment places the child at risk (probabilistically) for subsequent social difficulties, with lack of compliance and cooperation, increased aggressiveness and even maladjustment being, to some extent, expectable outcomes (or at least subsequent correlates).

The point of this essay, and my reason for writing it, have not been to argue that infant day care inevitably or necessarily results in an anxious-avoidant or otherwise insecure attachment and, thereby, increased risk for patterns of social development that most would regard as undesirable, but rather to raise this seemingly real possibility by organizing the available data in such terms. As stressed repeatedly, there is enough evidence to lead a judicious scientist to doubt this line of reasoning; by the same token, however, there is more than enough evidence to lead the same judicious individual to seriously entertain it and restrain from explaining away and thus dismissing findings that may be ideologically disconcerting. Anyone who has kept abreast of the evolution of my own thinking can attest to the fact that I have not been a consistent, ideologically-driven critic of nonmaternal care, whether experienced in the first year of life or thereafter. Having struggled to maintain an open-mind with respect to the data base, so that the evidence could speak for itself, I know how difficult a task this is.

It is certainly true that much of the evidence that I have presented for purposes of raising concern (not alarm) and encouraging others to reconsider the developmental correlates of infant day care could be organized in a different manner. This not only should be, but has been done, and very well indeed (Clarke-Stewart & Fein, 1983; Hoffman, 1983; Rubenstein, 1985). It is also the case that virtually any one of the studies cited above could be dismissed for a variety of scientific reasons. But in the ecology of day care, perfect field research seems almost impossible; moreover, it would seem that the more perfect it is, the less generalizable it might be.

This complexity inherent to infant day care research underscores a point made earlier that cannot be sufficiently emphasized. Although I have entitled this paper "The 'Effects' of Infant Day Care Reconsidered," I have repeatedly used terms like nonmaternal care and supplementary care to stress the ecological confoundment of a host of factors relating to infant care usage--in all its varieties. When we find infants in care we are not only likely to find them in a variety of arrangements, usually resulting from their mothers working outside of the home, but also for a variety of reasons and with a variety of feelings and family practices associated with these care arrangements. Thus, infant day care refers to a complex ecological niche, and probably to several niches. This means, then, that any developmental outcomes associated with care are also related to a host of other factors. Thus, it would be misguided to attribute any "effects" of nonmaternal care to the care per se, or even to the mother's employment. This would seem especially true in view of data indicating that families that use infant care differ from those that do not (e.g., Hock, 1980), that the kind of child one has may affect whether

supplementary care is used at all (McBride & Belsky, 1985; Volling & Belsky, 1987) and that, at least at older ages, children may differ in their functioning even before they enter day care (Roopnarine & Lamb, 1978; but see Everson, Sarnat, & Ambron, 1984).

Not to be lost in this discussion, however, is the fact that the correlates of extensive infant day care experience which have been chronicled (i.e., avoidance, insecurity, aggression, noncompliance, withdrawal) have been found across a host of ecological niches and caregiving milieus. Thus, these developmental correlates of extensive early supplementary care have been found in samples of impoverished (Haskins, 1985; Vaughn et al., 1980), middle-class (Belsky & Rovine, in press; Rubenstein, Howes, & Boyle, 1981), and upper-class families (Barglow et al., in press; Jacobsen & Wille, 1984), and with children cared for in unstable family day care (Vaughn et al., 1980), high quality centers (Haskins, 1985; Schwarz, Strickland, & Krolick, 1974), poor quality centers (McCartney et al., 1982), and even in-home, babysitter care (Barglow et al., in press). Such variation in the samples studied, yet similarity in the developmental outcomes associated with nonmaternal care in the first year, lead me to conclude at the present time that entry into care in the first year of life for 20 or more hours per week is a "risk factor" for the development of insecure attachment in infancy and heightened aggressiveness, noncompliance, and withdrawal in the preschool and early school years.

BEYOND BETWEEN-GROUP COMPARISONS

To conclude that extensive day care experience in the first year of life is a "risk factor" does not mean that each and every infant exposed

to 20 or more hours of nonmaternal care during this developmental period will be insecure, aggressive, or noncompliant. Indeed, to fail to recognize even in the face of such apparent risk that variation characterizes the development of children with extensive infant day care experience--and thus that some, probably many, and maybe even most children with such experience will not succumb to the risks my reading of the literature alerts me to--is to fail to understand both data analytic methods (with their emphasis on central tendencies) and the dynamic and complex nature of human development more generally.

As I myself have argued elsewhere (Belsky, 1984), as have many others, we need therefore to move beyond between-group comparisons and consider variation in outcomes and the factors and processes related to them. After all, in both the Barglow et al. (in press) and Belsky and Rovine (in press) studies which document reliable associations between attachment insecurity and extensive nonmaternal care, 50% or more of infants with such rearing experience established secure relationships with their mothers (see also Table 1). A critical issue for our understanding of day care involves the determinants of such variation in development. Although there is an abundance of theorizing about this issue, the data base remains thin and remarkably inconsistent with regard to care initiated in the first year of life. In this final substantive section, I consider the evidence to date regarding characteristics of parents and families, of infants, and of child care arrangements which may moderate the "effects" of infant day care experience and help to account for variation in the development of children with extensive nonmaternal care experience in the first year of life.

The Child Care Situation

On the basis of findings from the Bermuda studies of day care (McCartney et al., 1982; Schwarz, 1983), Scarr (1983) recently suggested that it may be center-based care in the first year that is most problematic. If this were so there would seem to be little reason for any real concern; after all, as noted in the introduction to this essay, only a small fraction of the children under 12 months of age whose mothers work are reared in such a context. Empirical support for the notion that it is infants from centers who may be most at risk comes from several investigations linking center-based infant care with aggression, noncompliance, and maladjustment (Haskins, 1985; McCartney et al., 1982; Rubenstein, Howes, & Boyle, 1981; Schwarz et al., 1974) and from Belsky and Rovine's (in press) within-group analysis indicating that among infants with 20 or more hours of nonmaternal care experience, those from centers were disproportionately likely to be insecure in their attachments to their mothers.

Evidence inconsistent with the notion that it may be centers which are responsible for adverse effects of early care, however, comes from studies showing that increased ability to get along with peers is associated with center care, that infants reared in such contexts are not always noncompliant or uncooperative with adults (Gunnarson, 1978; McCrae & Herbert-Jackson, 1976), and that center-rearing is not always associated with greater avoidance of mother (Brookhart & Hock, 1976; Doyle, 1975; Rubenstein, Howes, & Boyle, 1981). The findings from the Barglow et al. (in press) and Schwartz (1983) studies are also inconsistent with the center-as-influence argument, as neither of these even included infants from centers, yet both chronicled associations between extensive

nonmaternal care and heightened avoidance and, in the case of the Barglow et al. investigation, increased risk of insecurity. Also to be considered are Vaughn et al.'s (1980, 1985) data on lower-class infants with first-year day care experience; virtually none of the infant care experienced by these children who proved to be at heightened risk of anxious-avoidant relationships at one and for other difficulties at two years of age was center-based.

The fact, however, that most of the Minneapolis early-care-group children were in poor quality and even unstable supplementary care arrangements would seem to implicate quality of care. Not only has this factor been implicated as an important determinant of individual differences in the effects of day care on older children (see Belsky, 1984, for review), but recall that it was variation in center quality that emerged in the Bermuda studies as an influential factor (McCartney et al., 1982). Consistent with this notion, too, is the general lack of rearing-group differences in the Kagan et al. (1978) and Ricciuti (1974) investigations of infants cared for in model programs.

Before it is concluded, however, that this aspect of early care distinguishes studies documenting and failing to document rearing-group differences, it must be noted that both Haskins' (1985) and Schwarz et al.'s (1974) subjects who displayed heightened aggression were cared for in high-quality, university-affiliated programs. Also noteworthy is the fact that even though some scattered associations between variation in day care environments and developmental outcomes did emerge from an extensive investigation of community-based infant day care programs in New York City that did not focus upon attachment or socioemotional development more generally (Golden et al., 1978), the overall set of findings provide

surprisingly little support for the contention that quality is critical. This is especially true given the extensive effort made in this project to assess quality of care in the first year of life.

Despite these rather disappointing results, and the inconsistencies noted, it would seem inappropriate to abandon the notion that quality of care matters a great deal. Not only is there simply too much evidence which underscores the importance of variation in quality beyond the first year, but it is also risky to embrace null findings. Limitations in measurement must be entertained seriously. For the time being, then, I am led to conclude that while quality of care most likely matters a great deal, and will probably emerge as an important determinant of variation in the development of children with infant day care experience, the evidence to date is simply not sufficient to draw such conclusions with respect to care initiated in the first year.

Beyond the care locale (i.e., center) and quality of care, another parameter of the care situation which has been suggested to be important in accounting for variation in the developmental correlates of day care experience is the stability of care. Cummings (1980, 1986) has reported that familiar and stable caregivers reduce the stress experienced by infants and Suwalsky and her colleagues (1986) have found discontinuity in care arrangements to be associated with heightened insecurity. Unfortunately, when both Benn (1986) and Belsky and Rovine (in press) addressed this issue in their studies, it did not turn out to be the case that infants with extensive day care experience in stable arrangements were more likely to be secure with those experiencing changes in arrangements being at greater risk for insecurity. Once again, caution is called for before embracing null findings. For the time being it would

still make sense to recommend to parents not only that they seek the best quality care they can afford (obviously), but also that they recognize that changes in settings and caregivers are probably not in the infant's best interest. However wise such counsel may sound, it is unfortunately the case that for all too many families changing arrangements is the norm--and all too often due to circumstances beyond their control.

A final feature of the care situation to be considered--or better yet, reconsidered--is the timing of entry into nonmaternal care (Hoffman, 1983). On the basis of normative processes of infant development, one might expect that it would be more likely for care initiated in the second half of the first year to be associated with insecurity and/or subsequent social difficulties; this is because it is the second six months of life that is widely recognized as the period during which the attachment bond is crystallizing (Ainsworth, 1973). The absence of infant-mother attachment differences as a function of rearing experience in the Hock (1980) and Chase-Lansdale and Owen (1981) investigations is certainly consistent with this line of reasoning, as all children in infant care in these studies began care in the first three months of life. To be noted, however, is that neither Barglow et al. (in press) nor Belsky and Rovine (in press) could find any association between day care entry before and after six months and risk of insecurity, though limits of sample size may well have limited the sensitivity of the tests conducted. It must also be recognized that all of the children in the Haskins' (1985) study entered care early in the first year, yet were observed to be more aggressive than kindergarten and first-grade agemates who did not initiate care until sometime after the first year of life. Despite the fact that all of these latter studies suggest that timing of entry within the first year is

probably not the all-important factor, it would be useful in future research to distinguish between ages of entry even in the first 12 months; such information is all too rarely provided in research reports (e.g., Barglow, 1985; Doyle, 1975; Wille & Jacobsen, 1984).

Child Characteristics

It is well recognized that males are more vulnerable to stress across the lifespan and there is increasing indication that boys may be affected more adversely by early nonmaternal care than are girls (Belsky & Rovine, in press; Benn, 1985; Chase-Lansdale & Owen, 1981; Cochran & Robinson, 1983; Gamble & Zigler, 1986; Hock & Clinger, 1980; Rutter, 1981). Recent results of my own longitudinal research suggests, moreover, that parents may be sensitive to this risk. Upon comparing two sets of families, one in which mothers expressed interest prenatally in returning to the labor force in the first year following the birth of their first infant and actually did return to work and another in which mothers expressed comparable interest prenatally yet did not return to work, it was discovered that families in which mothers remained at home were far more likely than those that did not to have sons (Volling & Belsky, 1987).

In addition to child gender, it has been suggested that some infants, simply because of their constitutional make-up, may find the experience of daily separation associated with day care and the coping it necessitates to be especially difficult; the temperamentally inhibited infant who is prone to distress would seem to be especially vulnerable in this regard. Belsky and Rovine (in press) present the first empirical evidence consistent with this argument. Mothers of infants who experienced 20 or more hours of nonmaternal care in their first year and whose infants were classified as insecure in their attachment (to mother) appraised their

infants as more fussy/difficult at three months of age than did mothers of infants classified as secure who also experienced extensive nonmaternal care. Note must be taken of the facts, however, that these two groups of infants could not be distinguished on the basis of their behavior as newborns (Belsky & Rovine, in press) and that Benn (1986) found no relation between maternal reports of infant temperament and attachment security in her comparison of secure and insecure infants with extensive day care experience, though she employed a different temperament questionnaire than Belsky and Rovine (in press).

The possibility should not be overlooked that it may be those very infants least likely to be distressed by separation--and infants with insecure-avoidant attachments are among them (Frodi & Thompson, 1985; Gardner et al., in press; Thompson & Lamb, 1984)--who may be especially at risk with respect to nonmaternal care in the first year; this is because they may appear to be coping better than they actually are. Whereas infants more likely to become overtly distressed may succeed in soliciting extra attention, care, and consideration from parents and caregivers alike, those who are less expressive of their distress may be regarded as doing quite well when, in fact, they are experiencing stress.[2]

Maternal and Family Characteristics

Consideration of parental care in this discussion of risk factors draws attention to the family itself. Infants whose families are experiencing economic stress would seem to be at special risk not only because of the cost of quality care, but because such stress can undermine parents' capacity to be emotionally available to and supportive of their offspring. Even when economic stress is not severe, parental care may be affected by a host of processes operating within the family (e.g., marital

conflict) and beyond (e.g., job stress) that may influence the quality of care provided in the home and thereby the child's development (Belsky, 1984). Evidence that variation in care received in the home is of consequence for understanding variation in outcomes associated with infant care comes from a recent study of employed mothers; consistent with research and theory from the attachment literature (Ainsworth, 1973; Sroufe, 1979), Benn (1985) found that those women providing sensitive and responsive care had infants who developed secure attachments whereas those providing less sensitive care developed insecure attachment relationships.

In fact, both Benn's (1985, 1986) findings and those of Belsky and Rovine (in press) comparing families of secure and insecure infants exposed to 20 or more hours of nonmaternal care draw special attention to the mother herself. Not only did the mothers of the secure infants in the Benn (1985) study evince, in the course of eight hours of interview, "greater competence, emotional responsivity, warmth, and acceptance of motherhood" (i.e., maternal integration) (p. 7), but she also reported that the differences between employed mothers of secure and insecure infants on ratings of sensitivity and acceptance became insignificant once a composite index of maternal integration was statistically controlled. Such results led Benn (1986, p. 1230) to conclude "that the effects of maternal employment on mother-son attachment are mediated primarily by the mother's underlying emotional state" and that maternal "acceptance and sensitivity are overt manifestations of maternal integration which become associated with related child developmental outcomes because their connection to this more underlying property of mothers" (Benn, 1985, p. 12). Quite consistent with this line of reasoning is Belsky and Rovine's (in press) discovery that employed mothers of insecure infants

evinced less interpersonal sensitivity and empathy on a personality measure of interpersonal affect administered prenatally than did employed mothers of secure infants. In addition, the former group of women expressed less contentment with positive features of their marriage prenatally and indicated that they were more career-oriented (at nine months postpartum) in response to questions about their motivations for returning to work than did employed mothers of the secure infants.

Findings such as these alert us to the very interactional processes that take place between families and their infants which may mediate the relation between nonmaternal care, characteristics of the mother (and the marriage), and attachment security. Of interest in this regard are a series of studies which highlight differences between the care provided to infants in and out of day care and to the implications of such experience. In one intriguing investigation, Pedersen and his colleagues (1983) observed that in families with five-month olds, those with working mothers (and presumably infants in some kind of supplementary care arrangement) had higher rates of mother-infant interaction yet lower rates of father-infant interaction than single-earner households. The investigators' quite reasonable speculation that working mothers may be displacing fathers by compensating for their time away from the infant during the day raises the possibility that such women might be insensitively overwhelming their babies with excess attention, affection, and stimulation. Such an interpretation is certainly consistent with time-use data which indicates that working mothers of older children interact as much with their children as do nonworking mothers (Hoffman, 1983), even though they have fewer shared waking hours to spend with their offspring. By trying, possibly, to make up for lost time, working mothers

may inadvertently exceed the information processing capacities of their infants, causing them to avoid interaction and contact. In essence, these mothers may be ~~meeting their own needs at the expense of their babies when they have missed so much during the day.~~ inadvertently producing an effect opposite to that which they intend by engaging in what they believe is compensatory attention they exacer effects of their being gone all day. That such a process could generate heightened avoidance is suggested by longitudinal data reported by Belsky, Rovine, and Taylor (1984), and replicated by Lewis and Feiring (1987), indicating that mothers of insecure-avoidant infants were more stimulating of their babies than those of secure infants (who were more stimulating than those of anxious-resistant infants). Also consistent with this interpretation are home observation data gathered by Schwartz (1983) which indicate that the very babies who displayed the most avoidance in the Strange Situation--those enrolled in full- and part-time day care--also experienced more frequent hugging and kissing from their mothers.

If, indeed, an interactional process of insensitive overstimulation is responsible for the heightened avoidance behavior of some infants reared in nonmaternal care in the first year, it would certainly seem possible to intervene to moderate this eminently understandable sequence of events. In fact, if intervention proved effective in reducing avoidance, it would clearly demonstrate that the avoidance correlates of infant care are just that; that is, they are not the result of nonmaternal care per se but rather of family processes associated with it.

A final family consideration not unrelated to the one just discussed is mother's attitude or satisfaction with her role. Hock's (1980) research indicates that when roles are not congruent with desires (working yet rather be staying home, staying home yet rather be working), infants display more avoidant and resistant reunion behavior in the Strange

Situation. This finding is consistent with other data in the more general maternal employment literature (Schubert et al., 1980; Stuckey et al., 1982), though Belsky and Rovine (in press) could find no support for it in their analysis of the determinants of secure and insecure infant-mother attachment relations within the subsample of infants found to be at risk for heightened insecurity--namely, those with 20 or more hours of nonmaternal care per week in their first year of life. Nevertheless, the proposition should still be entertained that some mothers who work yet would rather not and feel guilty about not having enough time to be with their babies may unintentionally--and caringly--overwhelm their infants with love, attention, and interaction in the evening and thereby generate infant avoidance in the service of arousal modulation (i.e., in order to prevent over-arousal and behavioral disorganization, the infant engages in gaze aversion and movement away from mother).

Before we accept too readily this scenario, some provocative (and potentially disturbing) findings emanating from a study of children beginning center or family day care in the second year must be considered. Even though Everson, Sarnat, and Ambron (1984), like Hock (1980), discovered that mothers who were employed yet did not strongly desire to work had toddlers who functioned less well four months after day care entry than did toddlers whose mothers were working and wanted to, six months later the results were decidedly different: Irrespective of role congruence, it was children whose mothers were "willing" rather than "reluctant" to place their children in supplementary care who functioned more poorly during an extensive battery of assessments administered 10 months following day care entry. More specifically, children of "willing" mothers were less cooperative with an adult playmate and shared with her

and helped her less. In addition, they were less likely to comply with their mothers' prohibitions regarding toy use. And finally, whether they were enrolled in nonmaternal care or not, those with mothers willing to use such care displayed, in the same problem-solving situation studied by the Minnesota group (Farber & Egeland, 1982; Vaughn et al., 1985), less persistence, enthusiasm, and effectiveness than children whose mothers held reluctant attitudes toward nonmaternal care (assessed prior to day care entry).

Interim Conclusion

Many of the findings just summarized regarding possible moderators of the "effects" of infant day care challenge prevailing assumptions that it is quality of care or maternal attitudes that are of critical significance, not simply experience in a nonmaternal child care arrangement. My intention has not been to argue that the factors and processes considered by many as established fact may not play a role in the influence process, but rather to indicate that in many cases the data are not only inconsistent with conclusions drawn (e.g., centers, quality), but that in some cases they are in the exact opposite direction (maternal attitudes). Nor has it been my goal to argue that it is nonmaternal care per se which poses risks to the child. It is clear that many factors and processes are confounded, that not all children realize the risks and that some account of variation in the development of infants with extensive nonmaternal care experience in infancy is called for. Those that have been offered, however, all too often fall short from an empirical standpoint. Perhaps the conclusion most permitted by the available data is that risks are heightened for boys and that maternal characteristics and home experiences seem to be the most well established moderators of

the relation between day care experience in the first year and child development. There can be no doubt that a great deal more research on the influence process is required before firm conclusions can be drawn and that prospective, longitudinal studies sensitive to the ecological complexity of infant day care usage are best equipped to illuminate the issues.

CONCLUSION

A decade ago a major question about day care was whether or not the absence of risks associated with high-quality, university-based, research-oriented day care programs would also prove to be characteristic of the kind of child care that is typically available to most families in most communities. Another major issue had to do with timing of entry and particularly with infant care. Not only has the employment of mothers with infants under one year of age skyrocketed in the ensuing 10 years, but dramatic changes have taken place in the experiences which children have who are subjects in day care research and in the kinds of measurements made of them.

A focus upon reunion behavior as a "window" on the security of the attachment relationship, coupled with the investigation of children from a variety of socioeconomic strata and a myriad of child care experiences, leads me to conclude that there are too many findings linking more than 20 hours per week of nonmaternal care experience in the first year with increased avoidance of mother following separation, heightened insecurity, and subsequent aggression and noncompliance to not draw attention to them and raise concerns about their meaning. These developmental correlates, it must be acknowledged, are seen virtually exclusively among children with extensive nonmaternal care experience, appear more probable in the

case of boys and, as indicated above, may have as much to do with the child's experiences at home as with any in the child care setting itself.

There has been a tendency in the research literature on day care to selectively cite evidence consistent with a preexistent point of view--and I have been charged with this sin (Phillips et al., 1987). I cannot deny the possibility that as a point of view begins to crystallize that certain data may take on more meaning than do others. What I can point to, however, is a record of relatively objective analysis over the past decade, a record which first led myself and my colleagues to conclude that few risks seem to be associated with day care but which, nevertheless, shows steady change and refocus (Belsky, 1984, 1985, 1986, 1987; Belsky & Steinberg, 1976; Belsky, Steinberg, & Walker, 1982; Bronfenbrenner, Belsky & Steinberg, 1978). This refocus has drawn my attention to variation in the experiences and development of children in day care and to the need to distinguish care in the first year of life with that initiated thereafter. The change has been that risks seem to be associated with extensive nonmaternal care in the first year.

I know from experience that this is not a popular point of view within the developmental sciences today. I also know that it is one that is charged with being politically and ideologically driven. In my mind there is no greater danger to a science of early childhood than the politicization of the research process. Years ago Urie Bronfenbrenner argued that science needs social policy because policy issues raise questions and concerns that can draw attention to important developmental processes and basic science issues. Whatever the benefits of this interface, we must recognize that risks are also involved. Social policy is dangerous to the developmental sciences to the extent that it makes

certain conclusions untenable or certain findings suspect. In point of fact, my reading of the literature leads to no inevitable or even necessary proposals with respect to public policy. Some can--and undoubtedly will--read my pronouncements as implying that mothers should not go to work in their infants' first year. Others can--and conceivably should--be led to conclude in view of the poor state of day care in this nation (Young & Zigler, 1986) that the current evidence demands that more effort be made to provide parents with affordable, quality care and with greater freedom and choice regarding their day care decisions. It remains for each reader to infer, then, what the implications of this review are--to families, communities, and to policy makers.

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FOOTNOTES

[1]A recent report by Burchinal and Bryant (1986) of infants from economically-impoverished families which purportedly shows no association between center-care and home-care is not considered in this paper because it remains unclear from the study design who was caring for the children in the so-called home-care groups.

[2]I would like to thank Megan Gunnar for suggesting this possibility during discussions of the temperamental bases of the propensity to cry upon separation from mother and of the association between avoidance and infant day care.

Table 1

Security of Infant-Mother Attachment and

Extent of Nonmaternal Care:

Cross-Study Analysis*

		EXTENT OF NONMATERNAL CARE		
		> 20 hours/week	< 20 hours/week	
ATTACHMENT SECURITY	Secure	96 (59%)	223 (74%)	319
	Insecure	68 (41%)	77 (26%)	145
		164	300	464

x^2 [1] = 12.31, $p < .0005$.

*Barglow et al., ~~in press;~~ 1987 Belsky & Rovine, ~~this report;~~ in press; Chase-Lansdale & Owen, in press; Jacobsen & Wille, ~~in press.~~ 1984